A-4. TABLES FOR MAMMALS

******* SHORT-TAILED SHREW *******

***** NORMALIZING AND CONTACT RATE FACTORS *****

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
BODY WEIGHT													
Barrett & Stueck 1976	A	B	-	-	16.35	2.47	SE g			4	Ohio 1972	lab	Maintained on a diet of mealworms.
Buckner 1964	A	B	-	-	20.1		g			11	Manitoba CAN 1955-57	lab	
Deavers & Hudson 1981	-	-	-	-	22.1	0.5	SE g			32	New York	lab	
Guilday 1957	-	M	-	SP	17.61	0.58	SD g	14.0	22.0	13	e Pennsylvania	various	Animals caught in April and May.
	-	F	-	SP	17.33	1.08	SD g	12.0	21.0	9			
Guilday 1957	-	M	-	SU	19.21	0.42	SD g	17.0	22.0	14	w Pennsylvania	various	Summer animals caught in August, fall animals caught in October and November.
	-	F	-	SU	17.40	0.48	SD g	14.0	21.0	15			
	-	M	-	FA	16.87	0.21	SD g	13.0	22.0	63			
	-	F	-	FA	15.58	0.23	SD g	12.5	22.5	57			
Guilday 1957	-	M	-	SU	15.70	0.37	SD g	12.0	21.0	27	c Pennsylvania	various	Animals caught in August and September.
	-	F	-	SU	15.25	0.37	SD g	12.0	19.0	20			
Lomolino 1984	-	-	-	-	18		g				New York	Thousand Islands	
Schlesinger & Potter 1974	A	B	-	-	15.0	0.78	SD g			24	New Hampshire 1971	forest	Most females weighed less than the mean.
LEAN (DRY) BODY WEIGHT													
Schlesinger & Potter 1974	A	B	-	-	4.4	0.24	SD g						

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
METABOLIC RATE (OXYGEN)													
Buckner 1964	A	B	ST	-	110.4	19.2 SD	lO2/kg-day	100.8	129.6	11	Ottawa, CAN	lab	9-14 C below the thermoneutral zone (TNZ).
Deavers & Hudson 1981	A	-	BA	-	77.3		lO2/kg-day			7	New York	lab	Temperature = 38.3 degrees C; mean body weight = 20.5 g. N = number of animals tested (total test runs = 14).
Martinsen 1969	A	-	BA	-	52.3		lO2/kg-day				NS	lab	As cited in Deavers and Hudson 1981. Mean body weight = 19.0 g.
Morrison 1948	A	-	AD	-	127	15.3 SD	lO2/kg-day	94	218	8	NS	lab	(AD) = average daily metabolic rate. Eight runs for 4 animals (avg weight 21g). Room temp. ranged between 15-25 C.
Neal & Lustick 1973	A	-	BA	-	76.3		lO2/kg-day				NS	lab	As cited in Deavers and Hudson 1981. Temperature = 38.0 degrees C; mean body weight = 20.3 g.
Pearson 1947	A	-	BA	-	82		lO2/kg-day	80	84	2	Pennsylvania	lab	Mean weight of shrews = 21.2 g. Test conditions: basal - food withheld for 15 hours previous to test, temperature = 27 degrees C; average daily (AD) - 24 hour tests at 25-30 degrees C, food and water both available.
	A	-	AD	-	125		lO2/kg-day	106	150	5			
Platt 1974	A	-	BA	-	62.4		lO2/kg-day				NS	lab	As cited in Deavers and Hudson 1981. Temperature = 37.0 degrees C; mean body weight = 21.0 g.
Randolph 1973	-	-	1	WI	124.8		lO2/kg-day				CAN, Ontario	lab	Subject to different thermal radiation (in cal/cm2-min): (1) 0.415, (2) 0.258, (3) 0.102. Equivalent temperatures: (1) + 20C; (2) 0 C; (3) -20 C.
	-	-	2	WI	147.8								
	-	-	3	WI	202.3								
	-	-	1	SU	126.5								
	-	-	2	SU	151.2								
	-	-	3	SU	207.1								
METABOLIC RATE (KCAL BASIS)													
Buckner 1964	-	B	-	-	482	+/- 48 SD	kcal/kg-d			11	Ottawa, CAN	lab	"Standard" metabolism"; however, measured at 9 to 14 degrees C, which is well below the shrews' thermoneutral zone. Value labelled SD is a 95% confidence interval.

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Morrison et al. 1957	A	B	AD	-	680		kcal/kg-d				Wisconsin 1952	lab	AD = average daily metabolic rate. Based on average consumption rate of liver at 25 degrees C (0.56 g/g-day) and 1.22 kcal/g wet weight for liver.
Pearson 1947	A	-	BA	-	390		kcal/kg-d			2	Pennsylvania	lab	Calculated based on oxygen consumption. Mean weight of shrews = 21.2 g. Test conditions: basal - food withheld for 15 hours previous to test, temperature = 27 degrees C; average daily (AD) - 24 hour tests at 25-30 degrees C, food and water both available.
	A	-	AD	-	600		kcal/kg-d			5			
FOOD INGESTION RATE													
Barrett & Stuek 1976	A	B	AD	FA	0.49		g/g-day			4	Oxford, Ohio 1972	lab	Diet of mealworms, equivalent to 2.33 kcal/g live weight. Shrew assimilation efficiency for mealworms was 89.5 +/- 1.9 SD percent.
	A	B	AD	FA	10.9	0.13 SD	kcal/g-day			4			
	A	B	AD	FA	7.95	0.17 SD	g/day			4			
	A	B	AD	FA	18.5	3.8 SD	kcal/day			4			
Morrison et al. 1957	A	B	1	-	0.43		g/g-day			22	Wisconsin 1952	lab	Animals fed beef liver; temperature = 25 degrees C. Weight of tested animals (1) one animal at 28 g; (2) seven animals averaging 21 g. N = number of trials. .
	A	B	2	-	0.62		g/g-day			94			
Morrison et al. 1957	A	B	1	-	0.52		g/g-day			3	Wisconsin 1952	lab	Animals fed beef liver; temperature = 5 degrees C. Weight of tested animals (1) one animal at 28 g; (2) seven animals averaging 21 g. N = number of trials.
	A	B	2	-	0.77		g/g-day			11			
Morrison et al. 1957	A	B	1	-	0.55		g/g-day			2	Wisconsin 1952	lab	Animals fed newborn rats; temperature = 25 degrees C. Weight of tested animals (1) one animal at 28 g; (2) seven animals averaging 21 g. N = number of trials.
	A	B	2	-	0.96		g/g-day			17			
Randolph 1973	-	-	-	-	4.493	0.036 SE	kcal/12 hr				Ontario, CAN	lab	Measured in units of kcal/12 hrs. Minimum estimate.
Richardson 1973	A	M	-	-	0.541		g/g-day			10	Virginia	lab	In aquaria with tunnels; food type not described.

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
WATER INGESTION RATE													
Chew 1951	A	B	-	-	0.223		g/g-day			5	Illinois	lab	Studied at 19 degrees C, 54.5% relative humidity. Shrews fed raw ground horsemeat.
SURFACE AREA													
Pearson 1947	A	B	-	-	54		cm2				Pennsylvania	lab	Estimate for 21.2 g shrew.
Randolph 1973	-	-	-	-	70		cm2				Ontario, CAN	NS	Assumed value; source not identified.
THERMONEUTRAL ZONE													
George et al. 1986	-	-	-	-			degrees C	25	33		NS	lab	Computed by authors based on review of oxygen consumption rates.
Neal & Lustick 1973	-	-	-	-			degrees C	25	33	12	NS, 1972	lab	95% confidence limit.

***** DIET *****

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Hamilton 1941	A	B	insects		77.6			460	e US, mostly NY	NS - % frequency of occurrence; stomach contents	All seasons combined.
			annelids		41.8						
			vegetable matter		17.1						
			centipedes		7.4						
			arachnids		6.1						
			snails		5.4						
			small mammals		5.2						
			crustacea		3.7						
			undetermined		2.4						
Whitaker & Ferraro 1963	B	B	earthworms		31.4			221	New York 1960-61	NS - % volume; stomach contents	Season June through October.
			slugs and snails		27.1						
			misc animals		8.1						
			Endogone (fungi)		7.7						
			beetles		5.9						
			misc vegetation		5.4						
			lepidopteran larvae		4.3						
			chilopoda		1.8						
			other		8.6						

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
HOME RANGE SIZE													
Blair 1940	A	F	-	SU			ha	< 0.1	0.36	13	s Michigan	bluegrass	Monthly ranges calculated from live trapping during summer and early fall. Maximum ranges for both sexes recorded in September.
	A	M	-	SU			ha	< 0.1	1.8	13	1938-39		
Blair 1941	-	F	-	SU			ha	0.23	0.59	5	Michigan 1940	hardwood forest	Based on live trapping of animals caught five or more times in August and September.
	-	M	-	SU			ha		0.56	7			
Buckner 1966	B	B	-	-	0.3925	0.0364 SD	ha			34	s Manitoba 1952-58	tamarack bog	Mark and recapture (shows no relationship to sex, age, habitat or season).
Platt 1976	B	B	1	WI			ha	0.03	0.07		c New York 1968	old field	Home ranges of resident shrews during period of (1) high prey density; (2) low prey density. Territories had little overlap, winter is non-breeding season.
	B	B	2	WI			ha	0.10	0.22				
POPULATION DENSITY													
Blair 1940	-	-	1	SU			N/ha		0.89		s Michigan 1938-39	bluegrass	Estimate based on live trapping during summer and early fall. Year (1) 1938 (peak in late September); (2) 1939 (peak in late August).
	-	-	2	SU			N/ha		0.32				
Buckner 1966	B	B	1	-			N/ha	0.06	0.16		Manitoba CAN 1955-57	tamarack bog	Trap-mark-release-recapture technique. Values estimated from figure showing data for Plot 3. Year: (1) 1955; (2) 1956; (3) 1957. Peak populations found in September of all years.
	B	B	2	-			N/ha	0	0.51				
	B	B	3	-			N/ha	0.09	0.77				
Getz 1989	-	-	1	WI	5.3		N/ha				ec Illinois 1972-85	bluegrass	Generalized annual population cycle for bluegrass habitat (estimated from figure). Average for (1) Jan. Feb., Mar.; (2) Apr., May, June; (3) July, Aug., Sept., and; (4) Oct., Nov., Dec.
	-	-	2	SP	12.1		N/ha						
	-	-	3	SU	17.4		N/ha						
	-	-	4	FA	13.6		N/ha						
Getz 1989	-	-	1	WI	1.4		N/ha				ec Illinois 1972-85	tallgrass	Generalized annual population cycle for tallgrass habitat (estimated from figure). Average for (1) Jan. Feb., Mar.; (2) Apr., May, June; (3) July, Aug., Sept., and; (4) Oct., Nov., Dec.
	-	-	2	SP	2.3		N/ha						
	-	-	3	SU	7.8		N/ha						
	-	-	4	FA	8.0		N/ha						

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Getz 1989	-	-	1	WI	2.3		N/ha				ec Illinois 1972-85	alfalfa	Generalized annual population cycle for alfalfa habitat (estimated from figure). Average for (1) Jan. Feb., Mar.; (2) Apr., May, June; (3) July, Aug., Sept., and; (4) Oct., Nov., Dec.
	-	-	2	SP	5.9		N/ha						
	-	-	3	SU	11.4		N/ha						
	-	-	4	FA	10.0		N/ha						
Jackson 1961; Williams 1936	-	-	-	-			N/ha	1.6	121		Wisconsin	beech-maple	As cited in George et al. 1986.
LITTER SIZE													
Blus 1971	-	-	-	-	4.7	0.2 SE		1	8	80	Maryland 1966-68	lab	Count of young; considered minimal as some young may have been lost before they were counted.
Buckner 1966	-	-	-	-	6.3			5	8	8	Manitoba 1952-57	tamarack bog	Season is spring/summer; based on embryo count.
French 1984	-	-	-	-	5.4			2	8	18	Indiana 1976-79	NS	Season was February to September; based on embryo count.
Hamilton 1929	-	-	-	-	6-7						NS	NS	As cited in George et al. 1986.
Pearson 1944	-	-	-	-	4.5						NS	NS	As cited in George et al. 1986.
DAYS GESTATION													
Blus 1971	-	-	-	-	21-22		days				Maryland 1966-68	lab	Average period from pairing to parturition; includes a 2-3 day period during which ovulation is induced.
Hamilton 1929; Pearson 1944	-	-	-	-	21-22		days				NS	NS	As cited in George et al. 1986.
AGE AT WEANING													
Blus 1971	-	-	-	-	25-30		days				Maryland 1966-68	lab	
AGE AT SEXUAL MATURITY													
Blus 1971	-	M	-	-			days	65			Maryland 1966-68	lab	Approximate youngest ages of successful breeding. Female gave birth to a litter at the age of 65 days.
	-	F	-	-			days	45					

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Buckner 1966	-	-	-	-	10		months				Manitoba CAN 1952-57	tamarack bog	Age at which breeding began.
Dapson 1968	-	F	-	-			months	1-2			c New York 1960’s	woods, field	
	-	M	-	-			months	1-2					
French 1984	-	F	-	-	< 1		yr				Indiana	NS	
French 1984	-	F	-	-			months	< 4			Indiana 1976-79	NS	Evidence of sexual maturity found in individuals in age class 1 (approx. 0 - 4 months), and in age class 2 (4 to 8 months).
Pearson 1944	-	M	-	-			days	83			NS	NS	As cited in George et al. 1986.
ANNUAL MORTALITY													
Barbehenn 1958; Gottschang 1965; and Jackson 1961	-	-	-	WI			%/yr		90		sw OH, WI		As cited in George et al. 1986.
Blus 1971	-	B	-	-	27.4		%/weaning			383	Maryland 1966-68	lab	Mortality of captive-born shrews from birth. Weaning takes place at 25-30 days.
	-	B	-	-	40.5		%/3 months			321			
	-	B	-	-	54.2		%/6 months			203			
	-	B	-	-	74.1		%/9 months			112			
	-	B	-	-	91.3		%/year			46			
Pearson 1945	B	B	-	-	93		%/yr				MD, PA, NY, MA	various	
LONGEVITY													
Blus 1971	-	M	-	-	4.6		months				Maryland 1966-68	lab	Mean longevity of animals that survived to weaning (born and weaned in captivity); considered a "minimal" estimate by the author.
	-	F	-	-	4.4		months						
Dapson 1968	-	B	-	-			months		20		c New York 1960’s	woods, field	Approximate maximum age for wild Blarina sp.; few survive second winter.
Pearson 1945	-	B	-	-			years		2		MD, PA, NY, MA	various	Author notes that by two years a wild shrew would probably wear out its teeth and be unable to feed (only a small fraction survive long enough to have badly worn teeth).
Pearson 1945	-	F	-	-			months		30	1	MD, PA, NY, MA	lab	Female was wild-caught, male was captive-born.
	-	M	-	-			months		33	1			

***** SEASONAL ACTIVITIES *****

Reference	Begin	Peak	End	Location	Habitat	Notes
MATING						
Blair 1940		spring; fall		s Michigan 1938	bluegrass	Author suggests two peaks; one in spring and the other in early fall. Based on own data and review of papers from 1920 - late 1930's.
Buckner 1966	earl May		mid Aug	se Manitoba 1952-57	tamarack bog	
French 1984	Feb 29	Apr-May	Sept 11	Indiana 1976-79	NS	Latest and earliest dates of pregnancy in wild trapped shrews.
PARTURITION						
Dapson 1968		May-June		c New York 1960's	woods, field	Based on an investigation of tooth wear; some also born in March and January - December.
FALL/BASIC MOLT						
Findley & Jones 1956	Oct		Nov	NS	NS	As cited in George et al. 1986.
SPRING/ALTERNATE MOLT						
Findley & Jones 1956	Feb		July	NS	NS	As cited in George et al. 1986.

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
BODY WEIGHT													
Allen & Gulke 1981	J	M	1	-	5,006	608 SD	g			317	e N Dakota	NS	Age: (1) 0.5 years; (2) 1.5 years; (3) 2.5 years; (4) 3.5 years; (5) > 3.5 years. Estimated from skinned carcass weights and average ratio of skinned to unskinned weights of 0.87.
	A	M	2	-	5,361	521 SD	g			30	1970-78		
	A	M	3	-	5,357	579 SD	g			48			
	A	M	4	-	5,597	649 SD	g			20			
	A	M	5	-	5,716	1,067 SD	g			18			
Allen & Gulke 1981	J	F	1	-	4,256	549 SD	g			250	e N Dakota	NS	Age: (1) 0.5 years; (2) 1.5 years; (3) 2.5 years; (4) 3.5 years; (5) > 3.5 years. Estimated from skinned carcass weights and average ratio of skinned to unskinned weights of 0.87.
	A	F	2	-	4,263	566 SD	g			45	1970-78		
	A	F	3	-	4,529	457 SD	g			36			
	A	F	4	-	4,611	647 SD	g			15			
	A	F	5	-	4,769	678 SD	g			16			
Hoffman & Kirkpatrick 1954	A	F	-	WI	4,213	74 SE	g	3,360	5,680	52	Indiana 1947-49	various	Weights of animals collected at bounty stations.
	A	M	-	WI	5,253	78 SE	g	3,980	6,090	47			
Samuel & Nelson 1982	A	-	-	-			g	3,000	7,000		NS	NS	Summary of literature reviewed.
Sargeant 1978	A	M	-	SP	4,750	410 SD	g	4,370	5,430	5	e N Dakota 1970-74	lab	
	A	F	-	SP	4,680	167 SD	g	4,430	4,850	5			
Storm et al. 1976	A	M	-	FA	4,822	81 SE	g	4,131	5,675	19	nw Iowa 1968-69	farm and woods	Juveniles approximately 8 to 9 months old.
	J	M	-	FA	4,646	47 SE	g	3,632	5,811	87			
	A	F	-	FA	3,938	79 SE	g	2,951	4,585	22			
	J	F	-	FA	3,724	39 SE	g	2,951	4,540	68			
Storm et al. 1976	A	M	-	SP	5,250	179 SE	g	4,540	7,037	14	nw Illinois 1962, 67	farm and woods	Juveniles approximately 8 to 9 months old.
	J	M	-	SP	4,818	93 SE	g	3,859	6,129	32			
	A	F	-	SP	4,128	111 SE	g	3,269	4,722	13			
	J	F	-	SP	3,986	52 SE	g	3,632	4,494	24			
Vogtsberger & Barrett 1973	J	B	-	-	4,200		g			4	Ohio	captive	Age 23 weeks.
Voigt 1987	A	M	-	FA	4,100	90 SE	g			37	s Ontario, CAN	NS	
	A	F	-	FA	3,400	70 SE	g			37			
	J	M	-	FA	3,900	30 SE	g			162			
	J	F	-	FA	3,300	30 SE	g			139			

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
NEONATE WEIGHT													
Sheldon 1949	N	B	-	-	100		g				New York	NS	Approximate. As cited in Hoffman and Kirkpatrick 1954.
Storm et al. 1976	N	B	-	-			g	71	120		Illinois, Iowa 1966-70	farm and woods	
Storm & Ables 1966	N	B	1	-	110.6	8.9 SD	g	94	120	7	Illinois,	NS (wild)	(1) One litter from Illinois; (2)
	N	B	2	-	101.5	12 SD	g	71	109	9	Wisconsin		one litter from Wisconsin.
PUP GROWTH RATE													
Sargeant 1978	P	B	-	-	15.9		g/day			10	e N Dakota 1970-74	lab	From birth to weaning at 4.5 weeks of age. Estimated from unimpeded growth curve.
Storm et al. 1976	P	B	-	-	23		g/day			392	nw Illinois 1962, 67	farm and woods	From weaning to approximately 7 months of age.
Vogtsberger & Barrett 1973	P	B	-	-	25		g/day			4	NS	lab	From approximately 14 to 22 weeks of age.
WEANING WEIGHT													
Sargeant 1978	-	-	-	-	700		g				North Dakota	NS	Value is approximate.
METABOLIC RATE (KCAL BASIS)													
Vogtsberger & Barrett 1973	J	B	-	SU	193	56 SD	kcal/kg-d			4	Ohio 1971	lab	
FOOD INGESTION RATE													
Sargeant 1978	J	B	1	-	0.16		g/g-day			4	e N Dakota	lab	Ages(1) 5-8 weeks; (2) 9-12 weeks;
	J	B	2	-	0.12		g/g-day			4			(3) 13-24 weeks.
	J	B	3	-	0.11		g/g-day			4			
Sargeant 1978	A	B	1	SP	0.075		g/g-day			10	e N Dakota	captive	(1) Pair before whelping; (2) pair
	A	B	2	SP	0.14		g/g-day			10			after whelping.
Sargeant 1978	A	B	NB	-	0.069		g/g-day			10	e N Dakota	captive	Nonbreeding.
Vogstberger & Barrett 1973	J	B	-	SU	223	71 SD	kcal/kg-d				NS	lab	Units are in kcal ingested (not assimilated or metabolized) /kg body weight-day.

***** DIET *****

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Cook & Hamilton 1944	B	B	deer	5	-	2	7		New York 1937-42	riverine - frequency of occurrence; scats	From along Black River in southeastern Rensselaer County.
			grey squirrel	5	-	2	6				
			chipmunk	-	24	4	-				
			deer mouse	13	6	1	1				
			meadow vole	20	-	21	16				
			cottontail	60	35	18	57				
			short-tailed shrew	5	-	5	-				
			ruffed grouse	5	-	1	4				
			pheasant	-	6	-	-				
			grasshoppers	-	6	19	1				
			scarabs	3	6	-	-				
			ground beetles	-	6	3	-				
			other beetles	-	12	1	1				
			strawberries	-	24	-	-				
			brambles	-	24	1	-				
			apple	8	-	36	31				
			shadbush	-	29	2	-				
			cherry	-	12	33	3				
			wild sarsaparilla	-	6	-	-				
			blueberry	-	47	-	-				
			(sample size)	(40)	(34)	(141)	(70)				
Eadie 1943	B	B	prairie vole		52.3		63.1	313	s New Hampshire 1939-40	NS - % frequency of occurrence; scats	Summer = May 1 to Sept. 30; winter = Oct. 1 to April 30. Data represent mammalian portion of diet only. See next record for other types of food in diet.Prey representing less than one percent frequency not listed.
			NE cottontail		13.1		21.3				
			woodchuck		0.9		0				
			muskrat		0.9		6.3				
			livestock		0		5.8				
			gray squirrel		3.7		4.8				
			red squirrel		4.7		1.9				
			deer mouse		3.7		4.3				
			skunk		0		2.4				
			short-tailed shrew		2.8		1.9				
			long-tailed shrew		0.9		1.4				
			star-nosed mole		2.8		1.4				
			chipmunk		1.9		1.0				
Eadie 1943	B	B	mammals		82		95	313	s New Hampshire 1939-40	NS - % frequency of occurrence; scats	Summer = May 1 to Sept. 30; winter = Oct. 1 to April 30.
			birds		36		34				
			insects		81		3				
			vegetation		31		27				
			fishes		2		1				

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Green & Flinders 1981	A	B	rabbit		32		32	38-37	se Idaho 1976-77	sagebrush - % occurrence in scats	
			rodent		82		71				
			sheep		17		34				
			birds		10		13				
			insects		21		18				
			plants		34		34				
			(sample size)		(87)		(38)				
Halpin & Bissonette 1983	B	B	snowshoe hare				82.2		e Maine 1982-83	deep snow cover/90cm - % occurrence in scats	
			deer				17.7				
			small mammals				9.6				
			birds				11.3				
			vegetation				3.2				
Halpin & Bissonette 1983	B	B	snowshoe hare				56.0		e Maine 1982-83	shallow snow/31 cm - % occurrence in scats	
			deer				9.1				
			small mammals				36.3				
			birds				11.3				
			vegetation				7.8				
Hamilton 1935	B	B	meadow vole & mice				29.3	206	New York 1927-34	NS - % bulk; stomach contents	Most of the rodents consumed were meadow voles. Carrion included dead cattle, horse, or sheep from slaughter houses. Apple was the most frequent fruit consumed. Insects included grasshoppers, crickets, and beetles. Foxes collected in late fall and early winter.
			cottontail rabbit				22.1				
			grasses				13.9				
			dirt, sticks				6.2				
			carrion				8.1				
			fruit				5.3				
			insects				3.4				
			poultry				3.1				
			squirrels				2.9				
			porcupine				1.8				
			game birds				1.4				
			small birds				0.5				
			shrews				0.8				
			worms				0.8				
			grains and nuts				0.4				
Hamilton 1935	B	B	meadow voles & mice			33		66	VT, NH, MA 1913-32	NS - Number of times present; stomach contents	Data from Elton Clark, presented by Hamilton. Season is fall and winter.
			fruit (apple & wild cherries)			32					
			grasses			14					
			rabbits			8					
			poultry			6					
			carrion			5					
			corn			4					
			other			<4					

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Hamilton 1935	B	B	woodchuck		33+			31	NY & New England	NS - Number of items found in fox dens	
			rabbits		22+						
			poultry		13						
			game birds		6						
			moles & shrews		5						
			muskrat		5+						
			crow		3+						
			small birds		8						
			squirrels		4						
			insects		many						
			reptiles		5						
			other		< 3						
Hockman & Chapman 1983	B	B	meadow vole				11.3	128	Maryland 1977-78	Piedmont and Appalachian Province - % wet weight; stomach contents	Data from fall and winter and both Provinces combined.
			eastern cottontail				30.7				
			white-footed mice				1.3				
			unclassified mammal				4.8				
			raccoon				4.9				
			gray squirrel				2.8				
			norway rat				2.2				
			white-tailed deer				2.5				
			domestic cow				4.8				
			striped skunk				1.5				
			oppossum				1.4				
			unclassified bird				0.8				
			domestic chicken				6.6				
			ring-necked pheasant				0.8				
			pigeon				1.4				
			blackbird				1.2				
			starling				0.7				
			mallard duck				0.5				
			persimmon				11.4				
			corn				1.3				
			apple				0.7				
			black cherry				0.7				
			grasshopper/cricket				0.5				
			butterfly/moth larva				0.4				
			other/unspecified				4.2				
Hockman & Chapman 1983	B	B	mammal				81.4		Maryland 1977-78	Appalachian Province - % wet weight; stomach contents	Data from fall and winter combined. Summary for Province.
			bird				4.8				
			plant				7.0				
			insect				2.8				
			other/unspecified				4.0				
Hockman & Chapman 1983	B	B	mammal				67.0		Maryland 1977-78	Piedmont Province - % wet weight; stomach contents	Data from fall and winter combined. Summary for Province.
			bird				9.8				
			plant				15.6				
			insect				0.1				
			other/unspecified				7.5				

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Johnson 1970	B	B	moose	2.2	4.2	-	10.5		Michigan	Isle Royale, forest	Island wilderness with limited prey diversity. Most moose thought to have been killed by wolves. Near total dependence on fruit (mainly wild sasparilla) in Aug. and Sept.
			beaver	0.5	2.7	-	-		1966-68	-	
			muskrat	11.9	9.6	4.9	5.8			% occurrence;	
			snowshoe hare	10.6	11.2	23.0	57.9			scats	
			red squirrel	10.6	10.5	5.6	-				
			deer mouse	8.3	8.5	2.1	21.0				
			birds	15.1	6.7	16.7	-				
			amphibians/reptiles	2.2	2.1	-	-				
			fish	2.5	5.5	-	-				
			insects	8.9	4.6	4.2	-				
			plant matter	7.6	35.6	43.8	5.3				
			(number of scats)	(164)	(198)	(73)	(13)				
			(number of occur.)	(227)	(238)	(84)	(19)				
Knable 1970	A	B	mammals		67.1			170	Illinois	woodland,	Time of year not specified.
			(cottontail)		(25.2)				1956-67	agricultural	
			(prarie vole)		(15.2)					-	
			(deer mice)		(6.4)					% wet weight;	
			birds		10.3					stomach contents	
			reptiles		0.3						
			invertebrates		2.9						
			plants		18.6						
			(persimmon)		(10.2)						
			other/unspecified		0.2						
Knable 1974	A	B	mammals	92.2	37.1	61.7	65.0	18-82	Illinois	farm and woods	
			birds	2.4	43.2	0.2	8.6			-	
			arthropods	0.2	11.6	4.2	<0.1			% wet weight;	
			plants	4.6	6.3	31.1	26.1			stomach contents	
			unspecified/other	0.6	1.8	2.8	0.3				
			(sample size)	(51)	(18)	(32)	(82)				
Korschgen 1959	B	B	rabbits	24.8	10.7	36.5	38.7		Missouri	various	Stomachs from animals caught by hunters in most counties of the state. Only foods with percents greater than 1 included.
			mice/rats	24.2	6.2	21.3	22.5		1949-54	-	
			poultry	21.0	45.0	16.3	11.6			% wet volume;	
			other mammals	4.0	1.4	8.1	8.2			stomach contents	
			carrion	12.9	13.0	6.5	7.4				
			livestock	9.8	0.3	2.0	5.4				
			birds	0.6	1.2	1.1	3.8				
			invertebrates	TRACE	15.3	1.6	TRACE				
			plant foods	2.7	6.9	6.6	2.1				
			(sample size)	(52)	(29)	(86)	(839)				

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Kuehn & Berg 1981	B	B	snowshoe hare				28	430	nc Minnesota	NS	Mice and voles included Microtus pennsylvanicus, Peromyscus spp., Clethrionymus gapperi, and Synaptomys cooperi. "Other" included 18 mammalian species, as well as birds, fish, reptiles livestock, domestic poultry, and unidentified.
			mice and voles				19		1970-79	-	
			deer				16			% wet weight;	
			other				37			stomach contents	
Llewellyn & Uhler 1952	A	B	insects			3	3	33	Maryland	mixed, wildlife ref.	Values read from histograms.
			birds			8	2			-	
			rodents			28	48			% volume; how	
			rabbit			10	45			determined not	
			beechnut			17				specified	
			pokeberry			9					
			grapes			3					
			persimmon			22					
			other				2				
MacGregor 1942	B	B	skunk			19.7		57	Massachusetts	forested	In the 1930's and 1940's, the meadow vole (Microtus pennsylvanicus) was called a field mouse or meadow mouse. We assume the author's listing of "field mouse" means meadow vole.
			rabbit			17.9			1937-38	-	
			apple (fruit)			17.0				% total volume;	
			woodchuck			6.1				stomach contents	
			chicken			5.4					
			shrew			4.5					
			deer mouse			4.4					
			porcupine			4.2					
			horse			3.5					
			meadow vole			3.0					
			grass			2.5					
			muskrat			2.3					
			blueberry			2.1					
			other			< 2					
Major & Sherburne 1987	A	B	deer	5	1	-	15		w Maine	coniferous forest	
			hare	84	32	83	61		1979-82	-	
			small mammals	11	48	50	32			% occurrence;	
			birds	11	8	-	17			scats	
			insects	5	14	-	-				
			raspberries	-	43	17	-				
			other fruit	-	13	-	-				
			(sample size)	(19)	(79)	(6)	(82)				

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Pils & Martin 1978	B	B	small mammals				2	85	s Wisconsin 1972-75	various - estimated % wet weight; stomach contents	Season not specified. 17 of samples were empty stomachs. Foxes collected off the Waterloo Study Area. Most collected in winter. In the Pils and Martin (1978) study, data are reported as % biomass; we assume this is equivalent to % wet weight. TR = trace.
			cottontails				66				
			unknown mammals				10				
			pig				1				
			domestic fowl				9				
			pheasant				8				
			unknown birds				4				
			plants (e.g. grass & corn)				TR				
Pils & Martin 1978	B	B	small mammals				4	47	s Wisconsin 1972-75	various - estimated % wet weight; stomach contents	Season not specified. 13 of sampled stomachs were empty. Foxes collected on the Waterloo Study Area. Most collected in winter. TR = trace.
			cottontails				49				
			opossums				11				
			skunk				7				
			domestic fowl				15				
			pheasant				3				
			unknown birds				8				
			plants (e.g. grass, corn)				TR				
			other/unspecified				3				
Pils & Martin 1978	B	B	cottontail	34.6				58	s Wisconsin 1972-75	various - estimated % wet weight of prey found in dens	Data from March to July.
			muskrat	5.3							
			fox squirrel	2.1							
			unknown mammal	2.1							
			domestic rabbit	5.4							
			opossum	3.1							
			raccoon	6.9							
			pig	1.4							
			ring-necked pheasant	17.2							
			mallard duck	1.0							
			domestic fowl								
			chicken	11.3							
			duck	3.2							
			goose	1.4							
			other/unspecified	5.0							
Pils & Martin 1978	B	B	small mammals				4.5	47	s Wisconsin 1972-75	farm, pasture, woods - estimated % wet weight; winter kills	Percent biomass based on winter tracking of red foxes--frequency of kills.
			cottontail				80.8				
			pheasant				6.5				
			unknown passerine				0.8				
			great horned owl				6.7				
			mourning dove				0.7				

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Pils & Martin 1978	B	B	cottontail	37	21	72	57.5	-	s Wisconsin	various	Sample sizes: 132 stomachs; 1,020
			skunk	-	-	-	3.5		1972-75	-	scat samples; 58 dens; and 182.6 km
			opossum	-	-	-	3.5			estimated % wet	of tracking.
			raccoon	5	-	-	7.5			weight; summary of	
			unknown mammal	16	44	12	7			den, scat, stomach	
			ring-necked pheasant	10	2	4	3			content and winter	
			domestic fowl	12	5	4	5			tracking data	
			unknown small mammal	-	2	1	2				
			muskrat	3	-	-	-				
			other birds	11	-	-	-				
			other	6	26	7	11				
Powell & Case 1982	B	B	rabbits				44.4	188	Nebraska	statewide	Summary of study below.
			small mammals				33		1978-79	-	
			pheasant				8.4			% wet volume;	
			other birds				11.2			stomach contents	
			misc.				2.0				
			not accounted for				1.0				
Powell & Case 1982	B	B	eastern cottontail				44.0	188	Nebraska	statewide	Measured by water displacement
			white-footed mouse				7.4		1978-79	-	method.
			vole (Microtus sp.)				5.9			% wet volume;	
			harvest mouse				3.0			stomach contents	
			jack rabbit(Lepus sp				5.2				
			unident. mammal				1.6				
			house mouse				1.3				
			Norway rat				2.5				
			striped skunk				2.6				
			grasshopper mouse				0.6				
			fox squirrel				2.2				
			raccoon				0.7				
			muskrat				0.7				
			unident. bird				6.3				
			ring-necked pheasant				8.4				
			meadowlark				2.0				
			domestic poultry				0.9				
			bobwhite				0.8				
			horned lark				0.5				
			mallard				0.5				
			powdery meal				1.2				
			apple				0.5				
			other/unspecified				1				

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Richards & Hine 1953	B	B	pheasant				2	63	sw Wisconsin	various - % occurrence; stomach contents	Sample includes 4 gray fox; trapped animals. Voles include prairie, meadow, and other Microtus spp.; mice include deer, other Peromyscus spp., harvest, and jumping.
			cottontail rabbit				45				
			muskrat				2				
			voles				50				
			mice				14				
			skunk				3				
			domestic cat				2				
			chicken				27				
			flicker				2				
			unident. bird				2				
			corn				7				
			deer				2				
			rat				2				
			woodchuck				3				
Richards & Hine 1953	B	B	upland game birds	18				33	sw Wisconsin 1948	various - % frequency of occurrence; prey remains at dens	Season is April to July. N = the number of dens. Upland game birds include pheasant, quail, and ruffed grouse; squirrels includes fox and gray; rodents include spermophile, chipmunk, deer mouse and Norway rat; and misc. birds include redwing, cardinal, flicker, meadowlark, catbird, crow, and unident. songbirds.
			cottontail rabbit	42							
			woodchuck	39							
			squirrels	48							
			muskrat	12							
			skunk	6							
			opossum	6							
			weasel	15							
			rodents	15							
			pig	9							
			chicken	88							
			misc. birds	66							
Sargeant et al. 1986	B	B	plants				49	70	ec N Dakota 1982-83	prairie farmland - % wet volume; stomach contents	Data from mean of two years. Foods making up less than 2% not included. Author notes that sunflowers have recently become one of the principal crops of N Dakota and waste seeds are often available in fall and winter.
			(sunflower seeds)				(47.5)				
			mammals				41				
			(Leporidae)				(10.5)				
			(Sciuridae)				(3)				
			(Cricetidae)				(20)				
			(Cervidae)				(5)				
			birds				3				
			refuse (carrion)				5.5				
			other				1.5				
Scott 1943 (regalis)	B	B	mammals		43.5			1,454	Iowa 1938-41	various - % frequency of occurrence in scats	Season = year round. Calculated from means of the three years of the study. A detailed breakdown of number of occurrences for 110 food types by month available in the Appendix of the original article.
			birds		14.7						
			invertebrates		23.2						
			plants		17.6						

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
HOME RANGE SIZE													
Ables 1969	A	M	-	-	512		ha			1	Wisconsin	diverse farmland	As cited in Samuel and Nelson 1982, and Maurel 1980.
Ables 1969	A	M	-	-	717		ha			1	Wisconsin	mixed: marsh,	Foxes tracked by radiotelemetry for
	A	F	-	-	96		ha	57	170	3	1964-65	forest, prairie,	13 consecutive months. Home range
	J	M	-	-	78		ha			1		shrubs, savannah	size estimated from fixes using
	Y	F	-	-	167		ha	142	191	2			modified minimum area method.
Johnson, Siniff, &	-	-	-	-			ha		1,040		NS	prairie pothole	As cited in Johnson and Sargeant
Warner (unpubl)	-	-	-	-			ha		1,300				1977.
Jones & Theberge	A	B	-	SU	1,611		ha	277	3,420	7	nw British	alpine and subalpine	Number of radiotracking fixes for
1982	A	M	-	SU	1,967		ha	514	3,420	4	Columbia		each animal was between 41 and 100.
	A	F	-	SU	1,137		ha	277	1,870	3			
Jones & Theberge	A	M	-	-	1,967		ha				59.8 N	NS	
1982	A	F	-	-	1,137		ha				latitude		
Kuehn & Berg 1981	J	M	-	WI	335		ha	90	580	2	nc Minnesota	NS	Foxes fit with radiocollars; home
	J	F	-	WI	220		ha			1	1970-79		ranges determined using the minimum
	A	F	-	WI	620		ha	330	980	3			area technique of Dalke and Sime (1938).
Major & Sherburne 1987	B	B	-	-	1,990		ha			4	w Maine 1979-82	forest and bogs	
Pils et al. 1981	-	-	-	-	1,037		ha				Wisconsin	NS	Supporting data not presented.
Sargeant 1972	A	F	-	SP	699	137 SD	ha	596	855	3	e c Minnesota 1964	woods, fields, swamp	May-June.
Sargeant et al. 1987	A	B	-	-	1,190	550 SD	ha/family	330	2,140	12	N Dakota	prairie farmland	Season = spring and summer. Some overlap found between the edges of fox and coyote territories.
Storm et al. 1976	-	-	-	-	960		ha/family				NS	NS	
Tullar & Berchielli 1980	J	B	-	SU	72.5		ha			137	sw New York	farm & woods	Estimated home range of pups during their first summer.
Voigt & Tinline 1980	-	-	-	-	900		ha	500	2,000		Ontario, CAN	farmland	As cited in Voigt 1987.

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
POPULATION DENSITY													
Ables 1974	B	B	-	-			N/ha	0.046	0.077		NS	"good fox range"	Summarizing maximum densities found in the United States.
Sargeant et al. 1975	B	B	BR	-	0.0010		family/ha	0.0005	0.0014	270	e N Dakota 1969-1973	prairie farmland	Min and max are means for one of the five years of the study. Based on aerial censuses of six townships in April (1969 only), May and June of each year.
Tullar & Berchielli 1980	B	B	BR	SP	0.0010		family/ha	0.0008	0.0011	151	nw New York 1972-77	farm & woods	Min and max are means from one of the five years of the study. About one third of the families were found to have ranges that overlapped those of other families.
Voigt 1987	B	B	-	SP	0.001		N/ha				n Ontario, CAN	northern boreal forests/arctic tundra	Summarizing his own unpublished data.
Voigt 1987	B	B	-	SP	0.01		N/ha				s Ontario, CAN	southern habitats	Summarizing his own unpublished data.
LITTER SIZE													
Allen 1984	-	-	1	-	4.96	2.94 SD				24	North Dakota	prairie potholes	Different years of the study: (1) 1972; (2) 1973; (3) 1974; (4) 1975; (5) 1976; (6) 1977; (7) mean across all years. Litter size determined by embryo count. Data averaged for all age females each year.
	-	-	2	-	4.07	2.05 SD				29			
	-	-	3	-	2.80	1.91 SD				20			
	-	-	4	-	3.50	2.62 SD				14			
	-	-	5	-	4.86	2.13 SD				42			
	-	-	6	-	4.29	2.06 SD				7			
	-	-	7	-	4.08		mean			136			
Allen 1984	-	-	1	-	3.13	2.31 SD				60	North Dakota	NS	Litter size determined by embryo counts. Females were divided into age groups; (1) 1 year old, and so on; (8) 8 years old.
	-	-	2	-	4.73	2.25 SD				26			
	-	-	3	-	4.85	2.19 SD				13			
	-	-	4	-	5.58	1.89 SD				19			
	-	-	5	-	4.75	1.28 SD				8			
	-	-	6	-	5.33	2.80 SD				6			
	-	-	7	-	6.50	0.71 SD				2			
	-	-	8	-	6.5	0.71 SD				2			
Dekker 1983	-	-	-	-	5			3	7	10	Alberta, CAN 1972-81	agricultural fields	

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Harris & Smith 1987	-	-	1	-	4.53	1.54	SD				Bristol, UK 1971-77	Urban	Age of female: (1) 1 year; (2) 2 years; (3) 3 years; (4) 4 years; (5) > 4 years; (6) mean across all ages.
	-	-	2	-	4.90	1.42	SD						
	-	-	3	-	4.75	1.73	SD						
	-	-	4	-	4.73	1.66	SD						
	-	-	5	-	4.94	1.70	SD						
	-	-	6	-	4.72	1.55	SD mean			252			
Harris & Smith 1987	-	-	1	-	4.65	1.43	SD				London, UK 1971-77	urban	Age of female: (1) 1 year; (2) 2 years; (3) 3 years; (4) 4 years; (5) > 4 years; (6) mean across all ages.
	-	-	2	-	5.06	1.74	SD						
	-	-	3	-	4.95	1.25	SD						
	-	-	4	-	4.89	1.29	SD						
	-	-	5	-	3.45	1.44	SD						
	-	-	6	-	4.76	1.52	SD mean			192			
Hoffman & Kirkpatrick 1954	-	-	-	-	6.8	0.338	SE	4	13	30	Indiana 1947-49	various	Based on horn enlargements and embryo counts. Female found with 13 normal appearing fetuses.
Pils & Martin 1978	-	-	1	-	5.2					27	s Wisconsin 1972-75	farm, marsh, pasture	Estimates (1) from excavated dens, (2) from embryo counts, (3) from placental scars.
	-	-	2	-	5.5					26			
	-	-	3	-	6.4					17			
Pils & Martin 1978	Y	-	-	-	5.9			2	8	22	s Wisconsin 1972-75	farm, pasture, woods	Average value of litters captured at dens, placental scars, and embryos. Y = yearling female.
	A	-	-	-	6.0			3	10	26			
	B	-	-	-	5.6			1	10	70			
Pils & Martin 1978	-	-	1	SP	5.4						s Wisconsin	farm, pasture, woods	(1) Average of 1972-75; (2) 1972, pups in dens; (3) 1973-75 pups, (4) 1973-75 placental scars, and (5) 1973-75 embryos.
	-	-	2	SP	4.6								
	-	-	3	SP	5.9								
	-	-	4	SP	5.9								
	-	-	5	SP	5.2								
Pils et al. 1981	A	-	1	-	6.9					326	Wisconsin 1976-78	NS	(1) Embryo count; (2) placental scars. Y = yearling female.
	A	-	2	-	5.4					43			
	Y	-	2	-	5.6					56			
Richards & Hine 1953	-	-	1	-	5.1	0.3	SE			25	sw Wisconsin 1946-50	various	(1) Live pups; (2) placental scars.
	-	-	2	-	5.1	0.2	SE			103			
Schoonmaker 1938	-	-	-	-	4.4						New York	NS	As cited in Storm et al. 1976; live pups.
Sheldon 1949	-	-	-	-	5.4						New York	NS	As cited in Samuel and Nelson 1982.
Stanley 1963	-	-	-	-	4.5						Kansas	NS	As cited in Samuel and Nelson 1982.

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Storm et al. 1976	-	-	1	SP	7.1						Illinois, Iowa	farms and woods	(1) Placental scars; (2) embryos; (3) live postpartum juveniles; (4) Illinois, pups in den; (5) Iowa, pups in den.
	-	-	2	SP	6.8								
	-	-	3	SP	4.2								
	-	-	4	SP	3.8			1	12	175			
	-	-	5	SP	3.5			1	10	384			
Storm et al. 1976	-	-	-	-	6.8			2	9	34	Illinois	farm and woods	Embryo count.
Storm et al. 1976	-	-	-	-	6.7			3	12	48	Iowa	farm and woods	Embryo count.
Switzenberg 1950	-	-	1	-	4.2						Michigan	NS	Live pups: (1) upper Michigan; (2) lower Michigan. As cited in Samuel and Nelson 1982.
	-	-	2	-	5.4								
DAYS GESTATION													
Asdell 1946	-	-	-	-	51-53		days				NS	NS	As cited in Voigt 1987.
Scott 1943	-	-	-	-	51		days				Iowa	NS	Approximate value.
Sheldon 1949	-	-	-	-	51-54		days				New York	NS	As cited in Samuel and Nelson 1982.
Storm et al. 1976	-	-	-	-	52		days				Illinois, Iowa	farm and woods	
AGE AT WEANING													
Ables 1974	-	-	-	-	8 - 10		weeks				NS	NS	Pups appear outside the den at about one month, and are weaned four to six weeks later.
Sargeant 1978	-	-	-	-	28-35		days				North Dakota	NS	Age leave the den; values approximate.
AGE AT SEXUAL MATURITY													
Asdell 1946	-	F	-	-	10		months				NS	NS	As cited in Samuel and Nelson 1982.
Storm et al. 1976	-	F	-	-	10		months				Illinois, Iowa	farm and woods	
ANNUAL MORTALITY													
Harris & Smith 1987	J	M	-	-	57.3		% as cubs				Bristol, UK 1971-77	urban	
	J	F	-	-	54.4		% as cubs						
	A	M	-	-	50.0		%/year						
	A	F	-	-	49.8		%/year						

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Harris & Smith 1987	J	M	-	-	66.2		% as cubs				London, UK 1971-77	urban	
	J	F	-	-	64.2		% as cubs						
	A	M	-	-	53.0		%/yr						
	A	F	-	-	56.0		%/yr						
Pils & Martin 1978	-	-	-	-	75.5		%/yr 1973				s Wisconsin 1973-75	various	Considered survival and recovery rates as function of the year recovered, independent of age.
	-	-	-	-	78.7		%/yr 1974						
	-	-	-	-	83.9		%/yr 1975						
	-	-	-	-	79.4		%/yr avg						
Pils & Martin 1978	-	-	-	-	76.5		%/yr 1973				s Wisconsin 1973-75	various	Assumed recovery rates were constant while survivorship rates were a function of year only and were independent of age.
	-	-	-	-	77.5		%/yr 1974						
	-	-	-	-	84.6		%/yr 1975						
	-	-	-	-	79.5		%/yr avg			3 yr			
Pils & Martin 1978	J	-	-	-	90		%/yr				s Wisconsin 1973-75	various	Estimated using life-table analysis to predict juvenile mortality from the remaining information.
	Y	-	-	-	80		%/yr						
	A	-	-	-	70		%/yr						
Pils et al. 1981	-	B	-	-			%/yr	75	85		Wisconsin 1973-75	NS	
Storm et al. 1976	J	M	-	-	83		%/yr				Illinois, Iowa 1966-70	farms and woods	
	J	F	-	-	81		%/yr						
	A	F	-	-	74		%/yr			45			
	A	B	-	-	77		%/yr			62			

LONGEVITY

Ables 1974	-	B	-	-	< 1		yr		3 - 4		North America	NS	Summarizing other study findings.
Harris & Smith 1987	B	M	-	-	1.01		years			571	London, UK 1971-77	urban	
	B	F	-	-	1.03		years			551			
Harris & Smith 1987	B	M	-	-	1.38		years			904	Bristol, UK 1971-77	urban	
	B	F	-	-	1.48		years			732			
Kuehn & Berg 1981	A	M	-	-			years		8.5	2	nc Minnesota 1970-79	NS	Of 816 trapped animals, only 6% exceeded 2.5 years of age.
Storm et al. 1976	-	-	-	-	<1.5		years		6	1	Iowa	NS	Based on recovery of an individual tagged as a juvenile.
Tullar 1983	A	F	-	-			years		8.5	1	New York	farm & woodland	Recapture of animal tagged as a pup.

***** SEASONAL ACTIVITIES *****

Reference	Begin	Peak	End	Location	Habitat	Notes
MATING						
Allen 1984	Jan 22	Feb 3-12	Feb 21	N Dakota	prairie	
Layne & McKeon 1956		Jan, Feb		New York	NS	As cited in Samuel and Nelson 1982.
Pils & Martin 1978	Dec 27	Jan 14	Feb 3	Wisconsin	various; Waterloo	Data reflects the conception date found in the study.
Scott 1943	late Dec		earl Jan	Iowa	fields & woods	
Sheldon 1949	late Dec		March	New York	NS	As cited in Samuel and Nelson 1982.
Storm et al. 1976	earl Dec	mid Jan	mid Feb	nw Illinois	farm, woods	
Storm et al. 1976	earl Dec	late Jan	late Feb	Iowa	farm, woods	
Storm et al. 1976		Jan-earl Feb		N Dakota	farm, woods	Cites N Dakota Game and Fish Department.
Voigt 1987	late Jan		earl Feb	s Ontario, CAN	NS	Summary of other studies (latitude 40-45 N).
Voigt 1987	Feb		March	n Ontario, CAN	NS	Summary of other studies (latitude 60-80 N).
PARTURITION						
Pils & Martin 1978	Feb 16	Mar 8	Mar 28	Wisconsin	various; Waterloo	
Sargeant 1972; Sargent et al. 1975		late Mar/Apr		e N Dakota	prairie	
Sargeant et al. 1981	earl Mar	Mar 31	late Apr	N Dakota	prairie	
Voigt 1987		Mar		southern CAN	NS	
Voigt 1987		May		northern CAN	arctic	
FALL MOLT						
Voigt 1987	Apr		Jun	NS	NS	

Reference	Begin	Peak	End	Location	Habitat	Notes
DISPERSAL						
Phillips & et al. 1972	late Sep			nw Illinois, ne Iowa	farm & woodlands	
Pils & Martin 1978	Oct		Mar	Wisconsin	various; Waterloo	Dates are for subadult animals.
Storm et al. 1976	late Sep		Mar	Illinois, Iowa	farm, woods	Males dispersed earlier than females.
Tullar & Berchielli 1980	Oct			New York	farm & woodlots	

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
BODY WEIGHT													
Fritzell et al. 1985	Y	F	P	-	6,640	930 SD	g			115	n Illinois 1979-81	NS	P = parous female, NP = nulliparous female.
	Y	F	NP	-	6,800	1,070 SD	g			59			
	A	F	P	-	7,090	1,060 SD	g			149			
	A	F	NP	-	7,140	750 SD	g			7			
Johnson 1970 (various)	A	M	-	-	4,309		g		8,800	277	Alabama	NS	Summary of the four Johnson 1970 records below.
	A	F	-	-	3,674		g		5,900	174			
Johnson 1970 (various)	A	M	-	WI	4,850		g			69	ec Alabama	NS	Values estimated from graphs.
	A	F	-	WI	3,860		g			37			
	A	M	-	SP	3,450		g			10			
	A	F	-	SP	3,180		g			8			
Johnson 1970 (various)	A	M	-	SU	5,171		g			1	ec Alabama	NS	Values estimated from graphs.
	A	F	-	SU	3,720		g			2			
	A	M	-	FA	5,350		g			12			
	A	F	-	FA	4,360		g			17			
Johnson 1970 (various)	A	M	-	FA	3,770		g			30	sw Alabama	NS	Values estimated from graphs.
	A	F	-	FA	3,770		g			30			
	A	M	-	WI	4,310		g			56			
	A	F	-	WI	3,360		g			30			
Johnson 1970 (various)	A	M	-	SP	3,540		g			32	sw Alabama	NS	Values estimated from graphs.
	A	F	-	SP	3,270		g			15			
	A	M	-	SU	4,220		g			7			
	A	F	-	SU	3,540		g			9			
Kaufmann 1982	A	B	-	-			g	3,600	9,000		United States	NS	Males outweigh females by 10 to 15%. Northern specimens are heavier than those in the south.
Kaufmann 1982	J	-	-	FA			g	2,700	3,200		Alabama	NS	
Kaufmann 1982	J	-	-	FA			g		7,000		Missouri	NS	
Moore & Kennedy 1985	A	F	-	WI	4,300		g				Tennessee	NS	Total sample size (males and females) = 98 raccoons captured 256 times.
	A	F	-	SP	3,330		g						
	A	F	-	SU	3,700		g						
	A	F	-	FA	3,700		g						

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Moore & Kennedy 1985	A	M	-	WI	5,670		g				Tennessee	NS	Total sample size (males and females) = 98 raccoons captured 256 times.
	A	M	-	SP	4,280		g						
	A	M	-	SU	4,900		g						
	A	M	-	FA	5,100		g						
Nagel 1943	-	B	-	-	6,455		g			8,180	Missouri	statewide	Caught in Missouri raccoon season.
	-	M	-	-	6,759		g			5,371			
	-	F	-	-	5,742		g			2,809			
Sanderson 1984	A	M	-	-	7,600		g	7,000	8,300	2,115	wc Illinois	NS	NP = nulliparous female; P = parous female.
	A	F	NP	-	6,000		g	5,100	7,100	361			
	A	F	P	-	6,400		g	5,600	7,100	1,728			
	J	M	-	-	5,100		g	4,600	5,700	4,704			
	J	F	-	-	4,800		g	4,200	5,300	4,154			
Sanderson & Hubert 1981	A	M	-	-	7,740	89 SE	g			241	wc Illinois, 1955-80	NS	P = parous female; NP = nulliparous female.
	A	F	P	-	6,560	78 SE	g			183			
	A	F	NP	-	6,160	154 SE	g			52			
Sanderson & Hubert 1981	A	M	-	-	6,440	79 SE	g			149	se Illinois, 1955-80	NS	P = parous female; NP = nulliparous female.
	A	F	P	-	5,340	66 SE	g			135			
	A	F	NP	-	5,620	146 SE	g			15			
Sanderson & Hubert 1981	A	M	-	-	8,860	138 SE	g			126	nc Illinois, 1955-80	NS	P = parous female; NP = nulliparous female.
	A	F	P	-	7,560	108 SE	g			122			
	A	F	NP	-	7,600	237 SE	g			25			
Stuewer 1943a	A	M	-	WI	6,209		g			2	Michigan	riparian	
	A	M	-	SP	5,131		g			15			
	A	M	-	SU	6,521		g			23			
	A	M	-	FA	7,399		g			7			
Stuewer 1943a	A	F	-	WI	3,855		g			2	Michigan	riparian	
	A	F	-	SP	4,734		g			11			
	A	F	-	SU	5,358		g			23			
	A	F	-	FA	6,917		g			4			
NEONATE WEIGHT													
Ewer 1973	N	-	-	-	62-98		g				NS	NS	As cited in Eisenberg 1981.
Hamilton 1936	N	-	-	-	75		g				w New York	captive	
Stuewer 1943b	N	-	-	-	61.7		g			3	Michigan	riparian	

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
PUP WEIGHT													
Hamilton 1936	N	-	-	-	75	newborn SD	g				w New York	captive	
	P	-	-	-	200	7 days SD	g						
	P	-	-	-	450	19 days SD	g						
	P	-	-	-	570	30 days SD	g						
	P	-	-	-	680	40 days SD	g						
	P	-	-	-	910	50 days SD	g						
PUP GROWTH RATE													
Hamilton 1936	P	B	1	-	17		g/day				w New York	captive	Average growth rate for age classes: (1) 0-7 days; (2) 8-19 days; (3) 20-30 days; (4) 31-40 days; (5) 41-50 days.
	P	B	2	-	21		g/day						
	P	B	3	-	11		g/day						
	P	B	4	-	12		g/day						
	P	B	5	-	23		g/day						
Montgomery 1969	P	-	1	-	17.8		g/day				1962-63	lab	Different ages: (1) birth to 6 weeks; (2) approx. 6-9 weeks; (3) 10-16 weeks of age. All values combine two years of data.
	P	-	2	-	3.9		g/day						
	P	-	3	-	29.5		g/day						
Stuewer 1943b	P	F	-	SU	24.9		g/day			1	Michigan	riparian	Up to 14 weeks after birth.
	P	M	-	SU	26.4		g/day			2			
	P	B	-	SU	25.9		g/day			3			
METABOLIC RATE (OXYGEN)													
Mugaas et al. 1984	B	B	1	WI	9.36	1.68 SD	lO2/kg-day				Washington DC	National Zoo	Probably resting; conditions of experiment not described in abstract. Temperature ranges: (1) 15-35 C; (2) 5-10 C; (3) 25-35 C; (4) 20 C. Equations relating metabolic rate to ambient temperature provided.
	B	B	2	WI	11.04		lO2/kg-day						
	B	F	3	SU	8.64	1.68 SD	lO2/kg-day						
	B	M	3	SU	10.5		lO2/kg-day						
	B	B	4	SU	11.52		lO2/kg-day						
METABOLIC RATE (KCAL BASIS)													
Teubner & Barrett 1983	J	B	-	-	303.8		kcal/kg-d			4	Ohio	lab	Kcal ingested minus non-assimilated and growth energy.
	Y	-	-	-	402.1		kcal/kg-d			1			
FOOD INGESTION RATE													
Teubner & Barrett 1983	J	B	-	-	363.1	10.2 SD	kcal/kg-d			4	Ohio	lab	
	Y	B	-	-	457.0	10 SD	kcal/kg-d			1			

***** DIET *****

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Alexander 1977	B	B	trout	19				30	n. lower Michigan	aquatic - % wet weight; stomach contents	Year round.
			non-trout fish	4							
			crustaceans	14							
			molluscs	3							
			insects	3							
			amphibians	12							
			birds and mammals	19							
			vegetation	17							
			unidentified	9							
Dorney 1954	A	B	muskrat kits		34	9			Wisconsin 1949-50	marsh - % dry volume; scats	Age and sex not specified.
			muskrat adult	12	1	1					
			crayfish	31	31	16					
			fish	9	2	13					
			snails	2	3	10					
			corn	35	1	3					
			grapes		3	35					
			plums		9	2					
			other	11	16	11					
			(sample size)	(41)	(98)	(152)					
Hamilton 1951	A	B	fruits		37.9			94	New York 1947-50	NS - % wet volume; stomach contents	Season = April through October.
			insects		8.2						
			mammals		14.3						
			grains (e.g. corn)		14.7						
			earthworms		7.2						
			amphibians		4.4						
			vegetation		6.1						
			reptiles		3.0						
			molluscs		1.9						
			birds		1.5						
			carrion		1.5						
			unspecified		0.2						
Hamilton 1940	B	B	wild cherry		38.15			163	New York 1939	marsh - % dry volume; dry scats	Scats collected in July & September 1939.
			silky cornel		26.56						
			corn		6.65						
			insects		4.26						
			muskrat		4.07						
			grapes		3.70						
			mice		3.06						
			turtle		2.23						
			other		11.32						

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Hamilton 1936	A	B	buckwheat				15.78	127	w New York	various	Visceral tracts collected from
			apples				14.33		1927-34	-	hunters from mid November through
			beechnuts				14.17			% by bulk; visceral	late January.
			acorns				5.96			tracts	
			garbage				1.51				
			mice				8.04				
			corn				8.23				
			earthworms				8.44				
			fruit and berries				10.70				
			crayfish				1.92				
			insects				7.19				
			grasses and leaves				4.61				
			birds				0.53				
Johnson 1970	B	B	plant material	90	90	90	53		Alabama	various	Number of each type of sample not
(various)			(fruits)	(72)	(80)	(78)	(26)			-	provided: Author feels combining
			(acorns, pecans)	(1)	(0)	(8)	(18)			% occurrence;	the sample types provides a better
			(corn)	(1)	(12)	(3)	(10)			stomach, large	overall picture of the diet than
			(tubers - chufa, groundnut)	(15)	(2)	(5)	(5)			intestine, and scats	one type alone.
			animal material	39	34	25	44				
			(insects)	(33)	(32)	(22)	(23)				
			(crayfish)	(6)	(2)	(5)	(20)				
			(earthworms)	(0)	(0)	(TR)	(5)				
			(molluscs)	(0)	(0)	(0)	(6)				
			(fish)	(0)	(0)	(1)	(1)				
			(frogs)	(0)	(0)	(1)	(0)				
			(reptiles)	(2)	(0)	(TR)	(0)				
			(birds)	(2)	(2)	(TR)	(6)				
			(mammals)	(2)	(0)	(0)	(4)				
			(unidentified)	(5)	(12)	(8)	(13)				
			sample size	82	41	260	93				
Llewellyn & Uhler	-	B	crayfish	37	8	3	9	520	Maryland	forested bottomland	
1952			snails	5	5	3	6		1943-46	-	
			insects	40	39	18	12			% wet volume;	
			reptiles/amphibians	6	5	3	7			digestive tract	
			fish	3	2	TR	2				
			rodents	7	2	TR	8				
			corn	0	1	2	19				
			Smilax	0	TR	TR	6				
			acorns	0	TR	5	17				
			pokeberry	0	TR	17	2				
			wild cherry	0	17	2	0				
			blackberries	0	16	TR	0				
			grapes	0	TR	23	8				
			persimmon	0	0	11	7				

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
McComb 1981	A	B	corn			4.8	(12.1)		e Connecticut	forested	
			acorns			2.4	(7.1)			-	
			grapes			8.6	(21.2)			average weight (g)	
			apples			1.5	(5.2)			found in stomach and	
			pokeweed			0.2	(0.1)			intestines	
			other plants			1.5	(8.9)			(standard deviation	
			invertebrates			0.15	(0.35)			in winter column)	
			vertebrates			0.47	(1.40)				
			total ingested			19.62					
McComb 1981	A	B	corn			10.0	(22.2)		e Connecticut	agricultural	
			acorns			5.5	(10.4)			-	
			grapes			3.3	(12.6)			average weight (g)	
			apples			1.7	(10.2)			found in stomach and	
			pokeweed			0.8	(4.6)			intestines	
			other plants			2.6	(6.8)			(standard deviation	
			invertebrates			0.49	(1.93)			in winter column)	
			vertebrates			1.07	(4.38)				
			total ingested			25.5					
McComb 1981	A	B	corn			3.1	(10.8)		e Connecticut	urban	
			acorns			1.8	(4.5)			-	
			grapes			8.2	(16.2)			average weight (g)	
			apples			0.6	(2.7)			found in stomach and	
			pokeweed			0.4	(1.2)			intestines	
			other plants			0.5	(1.8)			(standard deviation	
			invertebrates			0.06	(0.09)			in winter column)	
			vertebrates			0.47	(1.36)				
			total ingested			15.13					
Schoonover & Marshall 1951	B	B	crayfish		31.60			135	nc Minnesota 1948-49	wildlife refuge - % dry volume; scats	Age and sex not specified.
			juneberries		26.8						
			grasshoppers		10.5						
			acorns		8.0						
			debris		5.7						
			meadow voles		2.7						
			plums		2.6						
			raspberries		2.5						
			other		10.2						
Stuewer 1943a	B	B	acorns	44.89	0	10.87	45.40		Michigan 1939-40	riparian - % occurrence; scats	Other mammals includes squirrel and cottontail; birds includes chicken, gallinaceous birds, pheasants, and non game birds, and; other berries includes dogwood berries, sand cherries, blueberries, and Rubus sp. berries.
			corn	18.36	0	26.09	18.18				
			earthworms	14.28	0	2.17	18.18				
			snails	16.32	6.66	0	18.18				
			insects	18.36	40.00	17.39	9.09				
			grapes	2.04	53.33	78.26	9.09				
			crustacea	0	0	0	9.09				
			Microtus	32.65	0	0	0				
(continued)			crayfish	34.69	13.33	10.85	0				

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Stuewer 1943a (continued)			buds	4.08	0	0	0				
			fish	12.24	0	4.34	0				
			moths	2.04	0	0	0				
			other mammals	4.08	0	0	0				
			frogs	10.20	0	0	0				
			snakes	4.08	0	0	0				
			birds	8.16	0	2.17	0				
			elderberry (Sambucus	0	0	10.87	0				
			other berries	0	40.00	0	0				
			caterpillars	2.04	6.66	0	0				
			amphipods	0	0	6.52	0				
			ragweed seeds	0	0	2.17	0				
			bark, wood, hair	0	0	0	18.18				
			(sample size)	(11)	(49)	(15)	(46)				
Tabatabai & Kennedy 1988	A	B	frogs	8.1	TR	0	0		Tennessee 1976-82	NS - % wet volume; digestive tract	Volume varied across regions: highest volume for western (across all seasons) = persimmon; for central = persimmon, corn, and sugar hackberry, and; eastern = persimmon and corn.
			fish	1.2	0	0	0				
			birds	TR	0	TR	8.4				
			mammals	1.7	0	1.4	0				
			other/unspecified	7.8	6.7	1.8	7.2				
			persimmon	0	35.8	57.3	27.4				
			corn	57.6	0	10.0	25.9				
			grapes	0	TR	10.2	0				
			pokeberry	0	20.5	4.5	0				
			acorns	0	0	5.4	4.2				
			sugar hackberry	0	0	5.5	18.4				
			cherry	0	29.5	0	0				
			insects	22.0	3.5	2.4	TR				
			crayfish	1.6	4.0	1.5	1.4				
			(sample size)	(11)	(18)	(104)	(74)				
Tabatabai & Kennedy 1988	A	M	persimmon		42.8			111	Tennessee 1976-82	NS - % wet volume; digestive tract	Data reflect all seasons; combined from eastern, central, and western Tennessee.
			corn		15.7						
			sugar hackberry		11.1						
			summer grape		6.7						
			acorns		1.9						
			pokeberry		2.1						
			peppervine		4.2						
			birds		3.9						
			other		TR						
			Alabama supplejack		2.8						
			Virginia creeper		1.5						
			bread		1.5						
			crayfish		1.3						
			frogs		2.4						
			beetles		0.7						
			wood		1.0						
			grasshoppers		0.5						
			voles		1.6						

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Tabatabai & Kennedy 1988	A	F	persimmon		43.8			96	Tennessee 1976-82	NS - % wet volume; digestive tract	Data reflect all seasons; combined from eastern, central, and western Tennessee.
			corn		16.7						
			sugar hackberry		6.1						
			summer grapes		1.9						
			acorns		6.8						
			pokeberry		5.7						
			greenbriar		3.9						
			peppervine		1.9						
			wasps		2.1						
			rabbits		2.1						
			birds		1.1						
			crayfish		1.6						
			wood		1.2						
			Virginia creeper		0.7						
			beetles		0.7						
			grasshoppers		0.5						
			voles		0.5						
			other		2.7						
Tester 1953	A	B	animals			27		94	ne Colorado 1951	riparian - % dry volume; scats	
			(crayfish)			(9.8)					
			(grasshoppers)			(12.4)					
			(small mammals)			(2.0)					
			plants			71.4					
			(corn)			(57.2)					
			(plums)			(6.9)					
			detritus			1.6					
Tyson 1950 (psora)	A	B	Mollusca (mussels & oysters)		44			20	sw Washington 1946	tidewater mudflats - % wet volume; stomach contents	
			Crustacea (shrimp & crabs)		25						
			Pisces (goby & cabezon)		9						
			Annelida (marine worms)		20						
			Echiurida (worm)		1						
Tyson 1950 (psora)	J	B	Crustacea (shrimp & crab)		50			9	sw Washington 1946	tidewater mudflats - % wet volume; stomach contents	
			Mollusca (mussels)		30						
			milk		18						
			Pisces (goby)		2						
			Echiurida (worm)		TR						

Reference	Age	Sex	Food type	Spring	Summer	Fall	Winter	N	Location	Habitat - Measure	Notes
Wood 1954	B	B	mammal				9.1	47	nc Minnesota	forest, prairie	
			bird				0.4		1950-52	-	
			cold-blooded verteb.				1.3			% dry volume; dried	
			insects				26.5			stomach contents	
			other invertebrates				5.5				
			plants				55.4				
			unidentified				1.5				
			other/unspecified				0.03				

***** POPULATION DYNAMICS *****

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
HOME RANGE SIZE													
Cauley & Schinner 1973	-	-	-	-	8.31		ha				NS	urban	As cited in Sherfy and Chapman 1980.
Fritzell 1978	A	M	-	SS	2,560		ha	670	4,946	9	N Dakota	prairie potholes	Spring/summer (SS); measured from April through July.
	Y	M	-	SS	1,139		ha	277	2,160	11	1973-75		
	A	F	G	SS	806		ha	229	1,632	7			
	Y	F	NB	SS	656		ha	222	1,263	8			
Hoffman & Gottschang 1977	A	M	-	-	15.8		ha			6	Ohio 1973-74	residential, woods	Trap determined minimum home ranges; based on animals caught three or more times. Authors describe the home ranges of this population as "extremely linear".
	Y	M	-	-	5.1		ha			6			
	J	M	-	-	2.8		ha			9			
	A	F	-	-	3.8		ha			10			
	Y	F	-	-	4.6		ha			5			
	J	F	-	-	2.3		ha			10			
Kaufmann 1982	A	B	-	-			ha	80	700		United States	NS	Kaufmann observed that most reported home range values reported fall into this range.
Lotze 1979	A	B	1	-	38	9 SE	ha			49	Georgia	coastal island	(1) Based on trapping data; (2) based on radiotracking. Includes data from all seasons.
	A	M	1	-	51	68 SE	ha			35			
	A	F	1	-	6	10 SE	ha			14			
	A	M	2	-	65	18 SE	ha			9			
	A	F	2	-	39	16 SE	ha			2			
Sherfy & Chapman 1980	B	F	-	-	165		ha			7	Maryland	varied	Based on radiotracking data. Females: (1) without young; (2) caring for young. Includes data from all seasons.
	B	M	-	-	285		ha			7	1976-77		
	-	F	1	-	122		ha						
	-	F	2		207		ha						
Sherfy & Chapman 1980	B	B	-	-	289		ha			14	Maryland 1976-77	varied	Based on radiotracking data. Mean for all raccoons monitored during study (variety of habitats). Includes data from all seasons.

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Sherfy & Chapman 1980	B	B	-	-	433.7		ha			2	Maryland 1976-77	coastal plain	Based on radiotracking data. Includes data from summer and fall.
Sherfy & Chapman 1980	B	B	-	SP	231		ha			4	Maryland 1976-77	Piedmont	Based on radiotracking data.
Sherfy & Chapman 1980	B	B	-	SP	275		ha			4	Maryland 1976-77	Appalachian	Based on radiotracking data.
Sherfy & Chapman 1980	B	B	-	-	37.4		ha			4	Maryland 1976-77	urban	Based on radiotracking data. Includes data from winter, spring, and summer.
Stuewer 1943a	A	M	-	-	204		ha	18.2	814	19	Michigan 1939-40	riparian	Calculated based on live trapping data; traps located primarily along water bodies. Juvenile data reflects first year of life when animals tend to remain with their mothers. Season = May to December in 1939 and May to October in 1940.
	A	F	-	-	108		ha	5.3	376	17			
	J	M	-	-	108		ha	2.0	719	27			
	J	F	-	-	45		ha	2.0	323	24			
Urban 1970	-	-	-	-	48.4		ha			9	Lake Erie, Ohio	Sandusky Bay/marsh	
POPULATION DENSITY													
Cowan 1973	-	-	-	-			N/ha	0.015	0.032		Manitoba, CAN	prairie	As cited in Kaufmann 1982.
Dorney 1954	B	-	-	SP	0.022		N/ha				Wisconsin 1950	marsh	
Fritzell 1978	B	B	-	SP			N/ha	0.005	0.01		e N Dakota	prairie potholes	Supporting data not provided.
Hoffman & Gottschang 1977	-	-	-	-	1.46		N/ha				Ohio 1973-74	residential, woods	Study area = 234.1 ha.
Johnson 1970 (various)	-	-	-	WI	0.12		N/ha			4	Alabama 1962-63		
Kaufmann 1982	-	-	-	-			N/ha		0.20		nw & e US	bottomlands, marshes	Summary of studies by Yeager & Rennels 1943; Butterfield 1944; Dorney 1954, Urban 1970, Van Druff 1971.
Slate 1980	-	-	-	-	0.13		N/ha				New Jersey		As cited in Sanderson 1987.
Sonenshine and Winslow 1972	-	-	-	-	0.17		N/ha				Virginia		As cited in Sanderson 1987.

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Stuewer 1943a	-	B	-	SU	0.025		N/ha				Michigan 1939	marsh, riparian	Considered a maximum estimate (just after birth of young).
Urban 1970	-	-	1	SP	0.17		N/ha				Lake Erie, Ohio 1967-68	Sandusky Bay/marsh	Calculation method: (1) Schumacher-Eschmeyer Formula; (2) Lincoln Index; (3) Hayne's method; (4) Average of the three methods.
	-	-	2	SP	0.21		N/ha						
	-	-	3	SP	0.14		N/ha						
	-	-	4	SP	0.17		N/ha						
Yeager & Rennels 1943	-	-	-	-	0.07		N/ha	0.04	0.16	881	Illinois 1940-41	NS	Value = number of raccoons captured; not representative population estimate. Sample size = 881 hectares. As cited in Sanderson 1987.
LITTER SIZE													
Asdell 1964	-	-	-	-				2	5		NS	NS	
Clark et al. 1989	A	-	-	FA	3.8			3.6	4.1	189	sw Iowa	agricultural	Minimum and maximum reflect lowest and highest average litter sizes in five years of data.
	J	-	-	FA	3.1			2.5	3.4	131			
	-	-	-	-	3.6	0.1 SE		2.5	4.1	320			
Dew 1978	-	-	-	-	2.6						w Tennessee	NS	As cited in Moore and Kennedy 1985.
Fritzell et al. 1985	Y	-	1	-	3.2					136	c Missouri 1979-81	NS	Age class (in years): (1) 1; (2) 2-3; (3) 4; (4) 5; (5) 6-7; (6) 8-12. Based on count of uterine scars.
	A	-	2	-	3.4					163			
	A	-	3	-	3.9					24			
	A	-	4	-	3.8					21			
	A	-	5	-	4.4					25			
	A	-	6	-	3.1					12			
Fritzell et al. 1985	-	-	1	-	3.4					297	n Illinois 1979-81	NS	Age class (in years): (1) 1-3; (2) 4 and older. Based on count of uterine scars.
	A	-	2	-	3.8					61			
Johnson 1970 (various)	-	-	-	-	2.43					76	Alabama	bottomlands, marsh	Based on count of placental scars.
Johnson 1970 (various)	-	-	-	-	2.48					101	Alabama	various	Live litters.
McKeever 1958	-	-	-	-	3.2	0.18 SE		2	5		sw Georgia, nw Florida	NS	Embryo count.
Sanderson & Hubert 1981	-	-	-	-	3.62	0.11 SE				122	nc Illinois	NS	
Sanderson & Hubert 1981	-	-	-	-	3.51	0.08 SE				182	wc Illinois	NS	

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Sanderson & Hubert 1981	-	-	-	-	2.92	0.09 SE				135	se Illinois	NS	
Stuewer 1943b	-	-	-	-	4			3	7	10	Michigan	riparian	Live litters.
LITTERS/YEAR													
Sanderson 1987	-	-	-	-	1		/year				most of range	NS	
Stuewer 1943b	-	-	-	-	1		/year				Michigan	riparian	
DAYS GESTATION													
Brown 1936	-	-	-	-	69		days				NS	lab	As cited in Goldman 1950.
Goldman 1950	-	-	-	-	63-70		days				NS	NS	
Hamilton 1936	-	-	-	-	63		days				w New York	NS	
Kaufmann 1982	-	-	-	-	64		days	54	70		NS	NS	Summary of several studies.
Lotze & Anderson 1979	-	-	-	-	63		days				NS	NS	
Sanderson 1987	-	-	-	-	63		days				Illinois	NS	Value is approximate.
Stuewer 1943b	-	-	-	-	63		days				Michigan	riparian	Value is approximate.
AGE AT WEANING													
Ewer 1973	-	-	-	-	70		days				NS	NS	As cited in Eisenberg 1981.
Montgomery 1969	-	-	-	-	84		days	63	112		NS	lab	Complete functional weaning usually by this time.
Stuewer 1943b	-	-	-	-	98		days				Michigan	riparian	Approximate value.
AGE AT SEXUAL MATURITY													
Fritzell et al. 1985	-	F	-	-	1		year				Illinois, Missouri	NS	Pregnancy rates for yearlings ranged from 38 to 77%.

Reference	Age	Sex	Cond	Seas	Mean	SD/SE	Units	Minimum	Maximum	N	Location	Habitat	Notes
Johnson 1970	-	M	-	-	15		months				Alabama	riparian, marsh	Juvenile males mature after the regular breeding season. About 10 percent of females thought to reproduce as yearlings in this study.
(various)	-	F	-	-			year	1					
Sanderson 1951	-	M	-	-	1		year				Missouri 1947-49	NS	Most males are mature as yearlings, but probably do not breed successfully in their first year because they mature after most females are already pregnant.
	-	F	-	-	1		year						
Stuewer 1943b	-	F	-	-	10		months			28	Michigan	riparian	At least 53% of yearling females produced young.
	-	M	-	-	2		years						
ANNUAL MORTALITY													
Clark et al. 1989	A	-	-	-	38		%/yr				sw Iowa	agricultural	
	J	-	-	-	42		%/yr						
Cowan 1973	A	-	-	-	>50		%/yr				Manitoba, CAN	NS	As cited in Kaufmann 1982.
	Y	-	-	-	60		%/yr						
Sanderson 1951	A	B	-	-	56		%/yr				Missouri 1948	NS	Hunted population; estimated based on the percent of first year animals in late winter within the population (assuming stable population numbers).
LONGEVITY													
Eisenberg 1981	-	-	-	-	49		months		165		NS	captive	
Flower 1931	A	M	-	-			years		9.5		London zoo	captive	As cited in Goldman 1950.
	A	-	-	-			years		13.5				
Johnson 1970	A	B	-	-	3.1		years		16		Alabama	NS	Mean calculated following the methodology of Sanderson 1951.
Lowery 1936	A	-	-	-			years		14		United Kingdom	captive	As cited in Goldman 1950.
Sanderson 1951	A	B	-	-	1.8		years				Missouri 1948	NS	Hunted population; based on estimate of 56% annual mortality and a population turnover time of 7.4 years.

***** SEASONAL ACTIVITIES *****

Reference	Begin	Peak	End	Location	Habitat	Notes
MATING						
Bailey 1936		Jan-Mar		Oregon	NS	As cited in Stuewer 1943a.
Cagle 1949		Mar		Louisiana	NS	As cited in Sanderson 1987.
Cunningham 1962		Mar		S Carolina	NS	As cited in Johnson 1970.
Hamilton 1936		Jan-Feb		w New York	NS	The peak occurs between late January and early February.
Johnson 1970	Jan	Feb	Mar	n United States	NS	
Johnson 1970 (various)	Mar 8	late Apr	Jun 26	Alabama	NS	Conception calculated from fetal growth curves or assuming a gestation period of 63 days.
McKeever 1958	Feb	Mar	Aug	sw Georgia, nw Florida	NS	
Sanderson & Nalbandov 1973	Dec	Feb	Apr	Illinois	NS	As cited in Sanderson 1987.
Sanderson 1987	Feb		Jun	ND, MN, Manitoba CAN	NS	Summary of several studies.
Seton 1929		Jan-Feb		Ohio	NS	As cited in Stuewer 1943a.
Stains 1956	Dec	Feb	Jun	Kansas	NS	As cited in Lotze and Anderson 1979.
Stuewer 1943b	Feb	Feb-earl Mar	Mar	Michigan	riparian	
Whitney and Underwood 1952		March		ec Minnesota	forest, wetland	As cited in Schneider et al. 1971.
PARTURITION						
Arthur 1928	Feb		Apr	Louisiana	NS	As cited in Johnson 1970.
Johnson 1970 (varius)	May 4	June 18	Aug 27	Alabama	NS	
McKeever 1958	Apr	May	Oct	sw Georgia, nw Florida	NS	

Reference	Begin	Peak	End	Location	Habitat	Notes
Sanderson 1987		Apr		Illinois	NS	
Stuewer 1943b	Apr	earl Apr	May	Michigan	riparian	
Urban 1970	Mar 15		June 1	L. Erie, Ohio 67-68	Sandusky Bay	
Whitney and Underwood 1952		earl May		ec Minnesota	forest, wetland	As cited in Schneider et al. 1971.
FALL MOLT						
Goldman 1950		summer		northern range	NS	
HIBERNATION						
Whitney and Underwood 1952	lat Nov		Mar/Apr	ec Minnesota	forest, wetland	As cited in Schneider et al. 1971.
DISPERSAL						
Stuewer 1943a		Fall	Winter	Michigan	riparian	Represents males and females in their first year; not all disperse.
Urban 1970		Fall		L. Erie, Ohio 67-68	Sandusky Bay	Data represents juvenile males.